Federal Automotive Statistical Tool (FAST)

Preparing for Vehicle-Level Reporting

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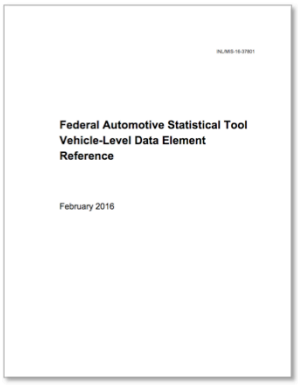
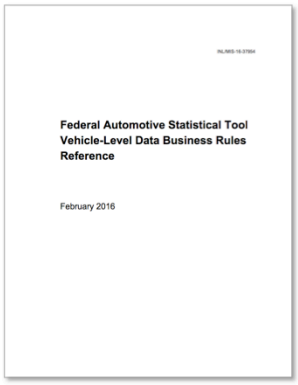
Agenda

- Availability of data element and business rules references
- The changing shape of fleet data
- Implications of moving to vehicle-level reporting
- Timeline
- Technical resources
- Timeline (revisited)
- Discussion / Q&A

Data Element / Business Rules References

- **Available now**

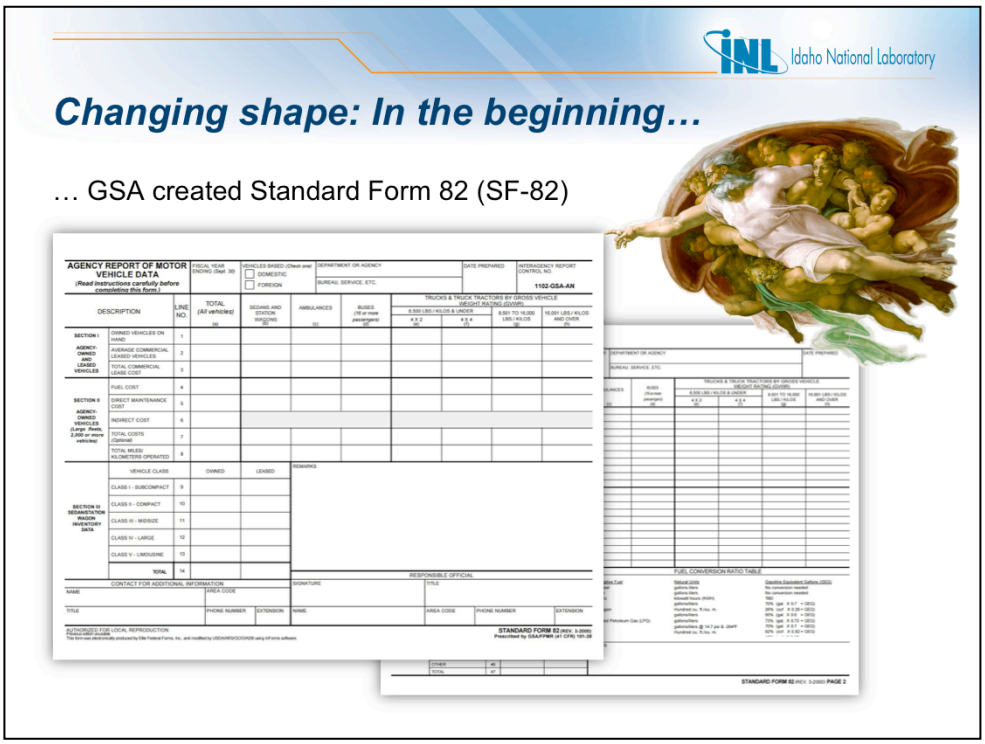




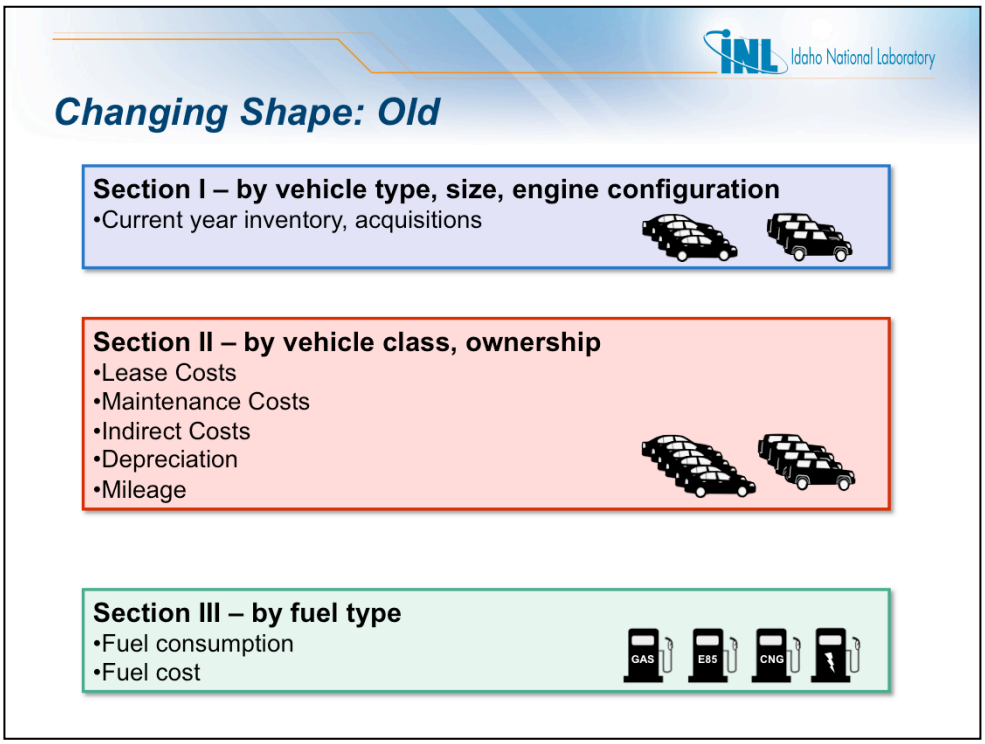
- **Current versions always available:**

  https://fastweb.inl.gov/help/index.cfm/resources/vehicle-level-data

Other resources related to VLD reporting in FAST will also be available through this same location; we'll touch on a couple of them later in the presentation.



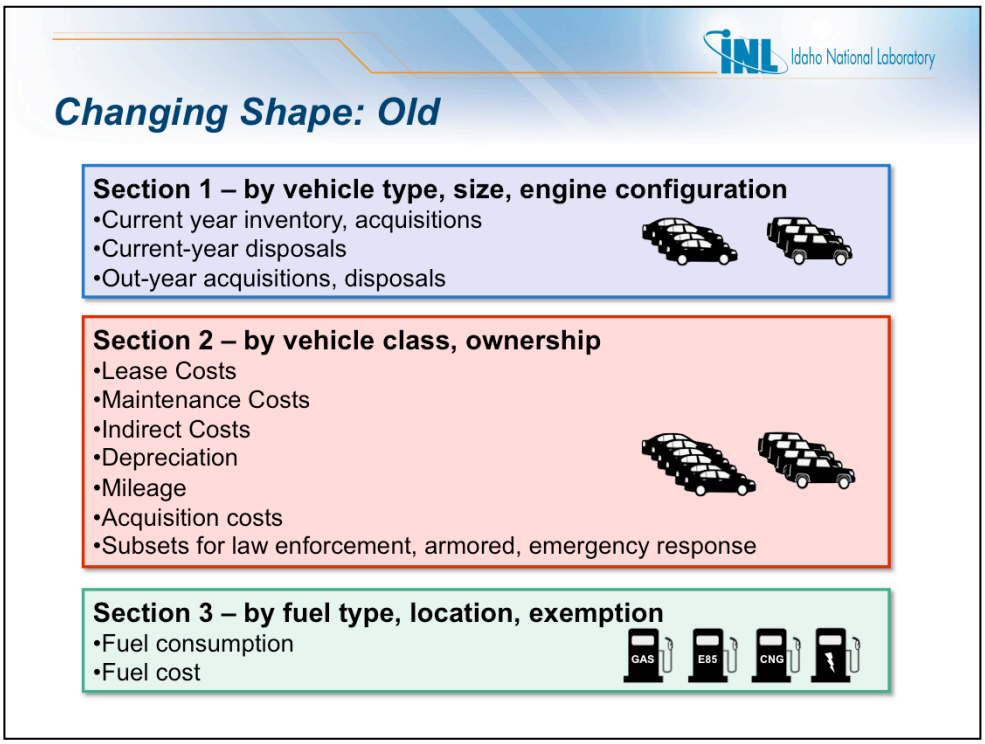
Shape of SF-82 drove the initial implementation of FAST (1999-2000) – including the basic shape of the data that is currently collected about the Federal fleet.



The SF-82 collected fleet data in three basic groupings or sections:

- Information above vehicle inventory and acquisitions during the prior fiscal year
- Basic cost and mileage data for classes of vehicles
- Fuel costs and consumption

Based on shape of SF-82, data was highly aggregated.



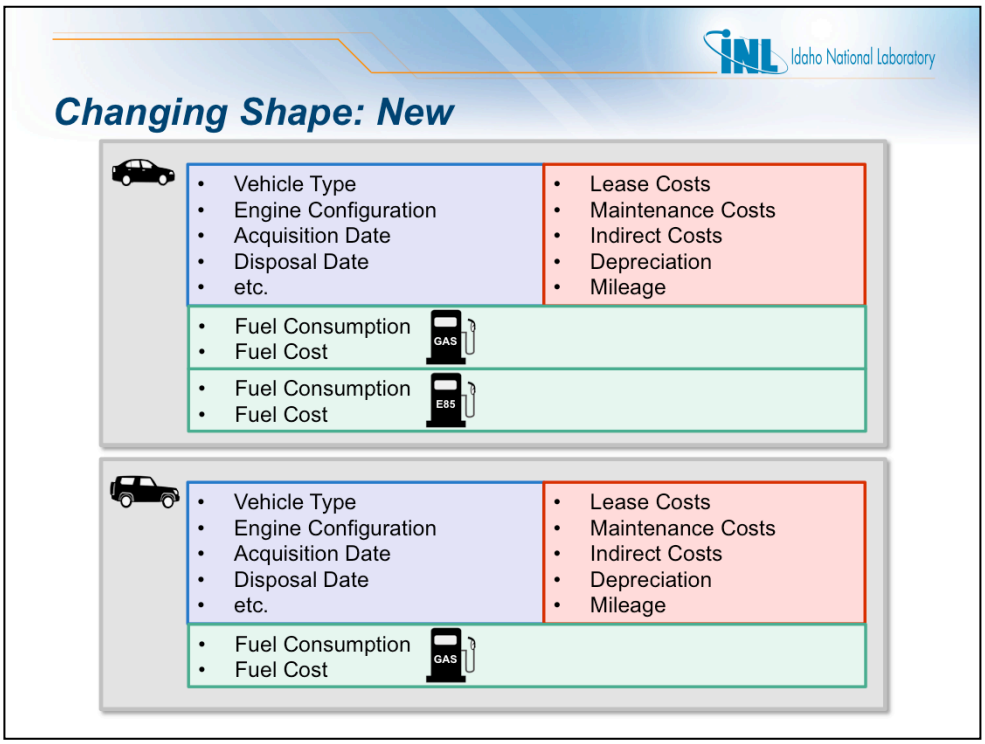
The “old” shape has evolved to collect additional detail over the past 16 years, but it is still the same three basic piles of data:

-Information about vehicles

-Information about costs and miles

-Information about fuel costs and consumption

Much more detail, but still highly aggregated and still collected as separate sections.



With vehicle-level data, each vehicle comes in as a separate uniquely-identified entity:

-All of the attributes for every individual vehicle that was part of your inventory at any point in the year (this is not a snapshot of what was in inventory as of the close of the FY):

-… along with all of the needed cost and financial data

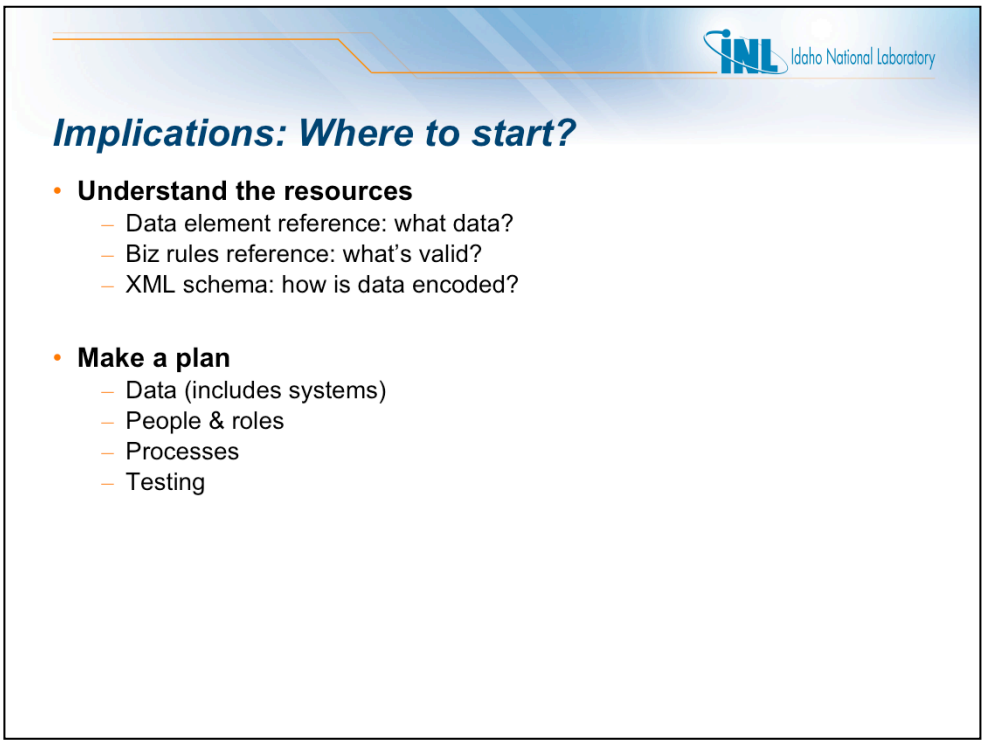
-… and its miles

-… and its fuel costs and consumption

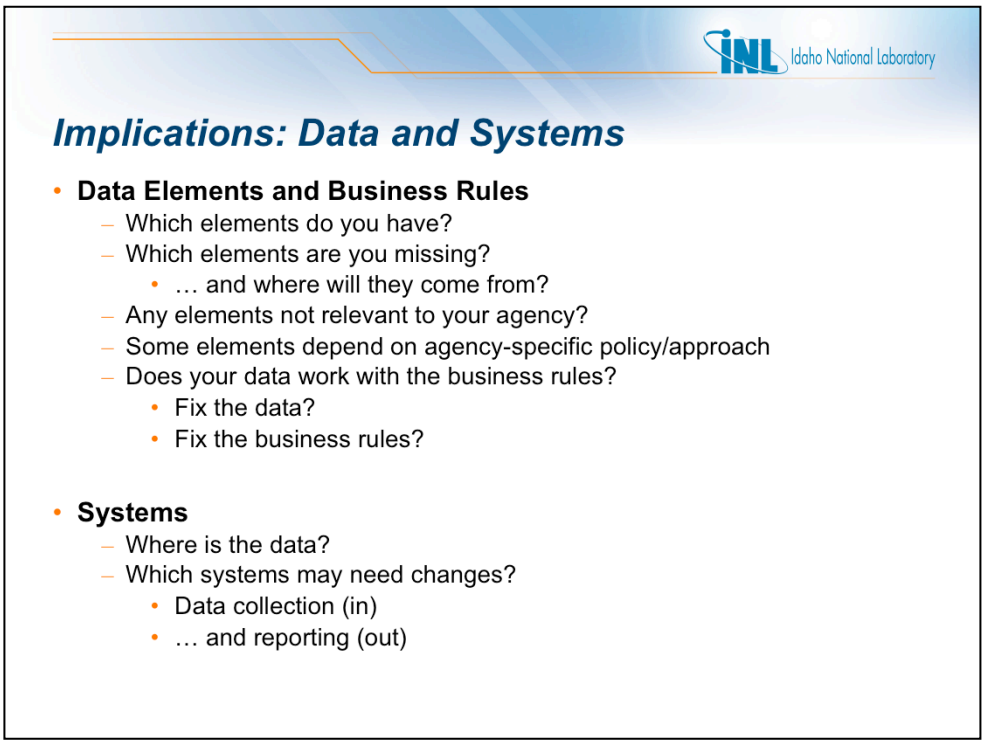
-… and all of the different designations with where it stands relative to the various underlying requirements

The identification of each vehicle is also consistent from year to year, making it possible to ensure consistency at a much more detailed level.

Having all data with corresponding vehicle eliminates potential mismatches between vehicles and costs (or miles or fuels) that the "three separate sections" approach makes possible. This shape will necessitate that all of the data for a given vehicle be present on a single system (not all vehicles on a single system, but all data for a given vehicle).



Each of the technical resources serve a different purpose and will be particularly useful at different phases in the migration process. We'll touch on each of those resources in more detail in a later portion of the presentation.



The data elements and business rules reference will be key to helping you look at your current dataset(s) and figuring out how big a gap you have between what you currently have and what you need to be collecting and capable of reporting.

Relevance of some data elements:

-Example: if you have an entirely GSA-leased fleet, some of the data elements related to ownership and capitalization won't be relevant to you and your systems.

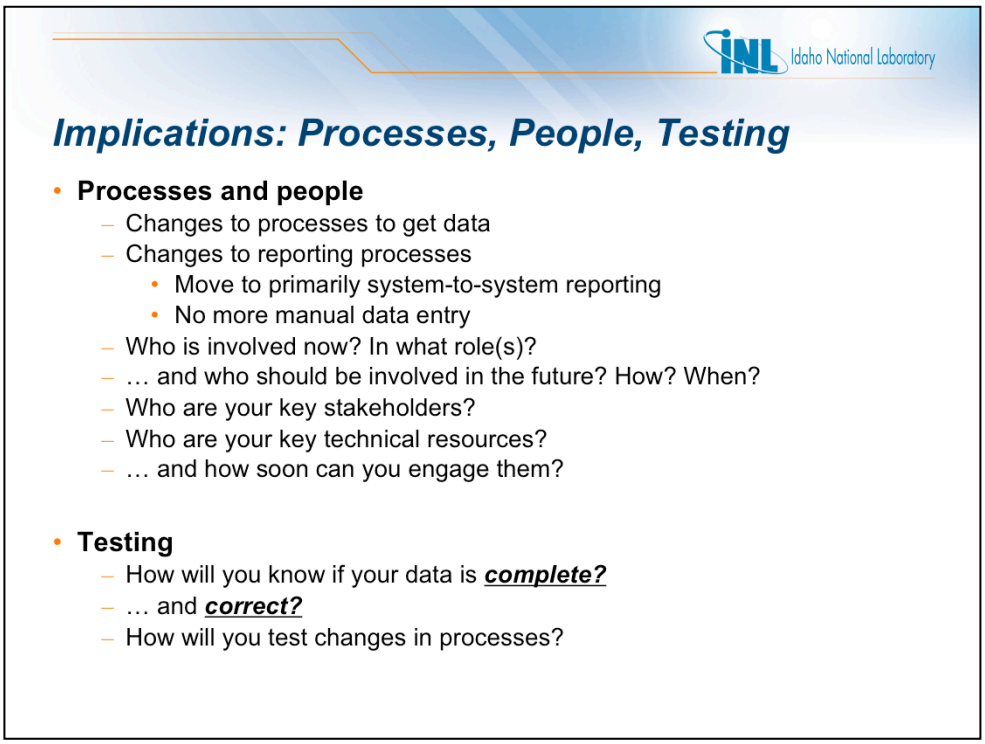
-Example: if your agency is not designated as being subject to EPAct, some attributes will just be specified as "N/A"

Important to understand what each data element is used for, so that – for example – costs get appropriately and consistently captured and characterized.

Also important to understand the business rules so that you understand how the data will be validated and evaluated for reasonableness:

-If your data isn't valid, is it a problem with the data? Fix the data.

-Is it a problem with the business rule? Reach out to us, particularly if you are working with one of the rules that will prevent data from being loaded (examples: vehicle manufacturer not in the supported list or a cost that exceeds an absolute limit).



Changes to processes to get data

-In some cases, this may be additional data needed from your MIS users when vehicles come into/go out of your fleet

-In other cases, this may be data that comes from other systems to your MIS

Changes to reporting processes

-Move to VLD is really intended to be a move to a streamlined (automated, for some organizations) reporting process

-Largely system-to-system (either system generates XML and then pushes it to FAST for automated processing, or system generates it and someone uploads the generated file to FAST for processing)

-If there are problems with the data the prevent it from being loaded into FAST, those problems will need to be fixed within the upstream MIS

-It's important that data in the Federal system (FAST) match the data in the agency system

-While all of the data within the VLD dataset in FAST will be visible at the vehicle level, there will not be a means of manually creating or revising VLD in FAST

-Particularly for organizations with large detailed reporting hierarchies with large numbers of users involved in data entry, this will represent a significant change

Technical resources: we recommend engaging them early in this process, if at all possible, to help with the gap analysis.

Testing:

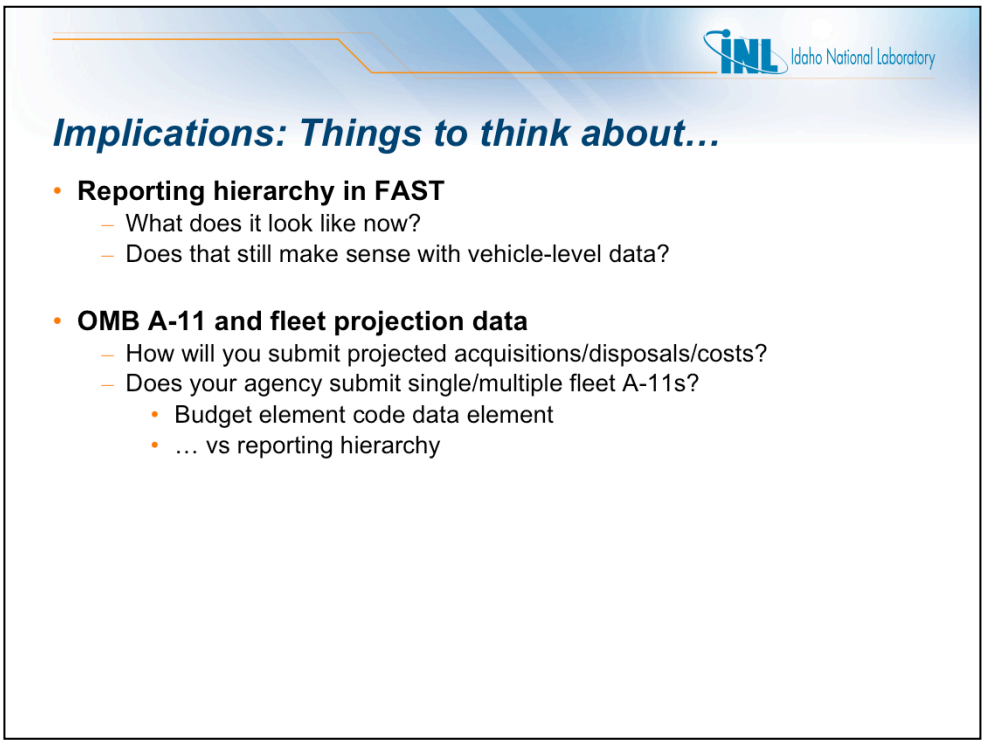
-Based on the changing shape (old vs new), possible that agencies will see some differences in high-level metrics

-What tools are available within your MIS to review data as part of the early part of preparing for FAST reporting?

-Do you have straightforward ways to get high-level metrics (inventory, acquisition, disposals for previous year; total mileage, total consumption by fuel type, etc.) so that you can compare those figures with what's going into FAST?

-There are (and will be) tools available through FAST to help with some of this, too:

- Sand box to test import processes (valid XML, what's preventing data from importing, what's getting flagged)
- Query tool capabilities specific to new VLD shape



Many of the current restrictions on how the hierarchy in FAST works and supports data will be lifted for VLD:

-No more concept of a "report element": vehicles can be associated with any hierarchy element

-No more foreign/domestic distinction for hierarchy elements: each vehicle gets its own designation

-EPAct exemptions identified strictly at the vehicle level rather than via a combination of hierarchy element and vehicle

This means all agencies could – if they want to and if it makes sense for them – report all of their vehicles as a single large lump of vehicles attached to what they have always thought of as the "agency element" within their reporting structure. But there are also good reasons that that approach might not make sense:

-Where is the data coming from?

-Who should be able to see it?

-How does your organization collect fleet projections and submit A-11 information?

-Do you want "bureau" level continuity for historical reasons?

In general, our recommendation would be to go as simple as possible and maintain only the minimal required hierarchy and the minimal number of people involved in the actual reporting of data to FAST.

OMB A-11 and fleet projections data:

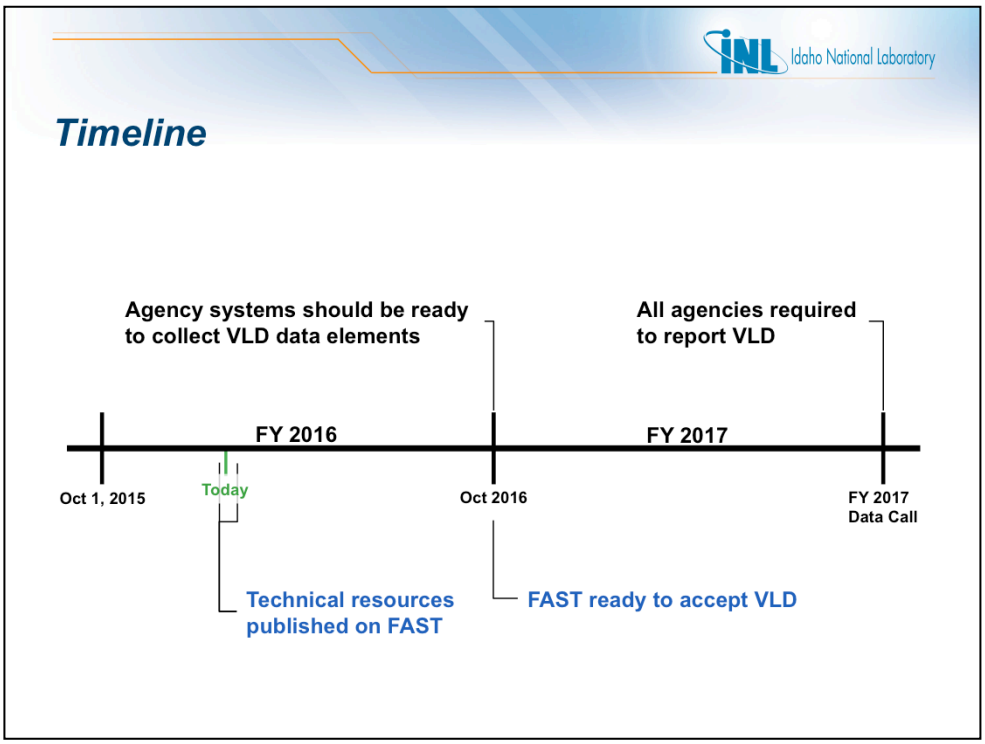
-How does your organization pull together fleet projections: Central agency MIS or bottom-up within FAST?

-Does your organization submit a single A-11 summary, or multiple A-11 summaries?

-VLD provides the ability to identify which vehicles fall where within the agency's A-11 submission(s)

-Cases range from very simple (single A-11, projections captured/fabricated within MIS) to complex (multiple A-11s, projections fabricated at individual component fleet/motor pools and rolled up to lower-level A-11 summaries) and several variations in between

-Probably worth a separate conversation with us when you get ready to consider this aspect of your plan for moving to VLD



Key points on this timeline:

-Based on the EO, FAST has to be ready to accept VLD by December 15, 2016

-Current schedule has FAST ready to accept VLD in October 2016

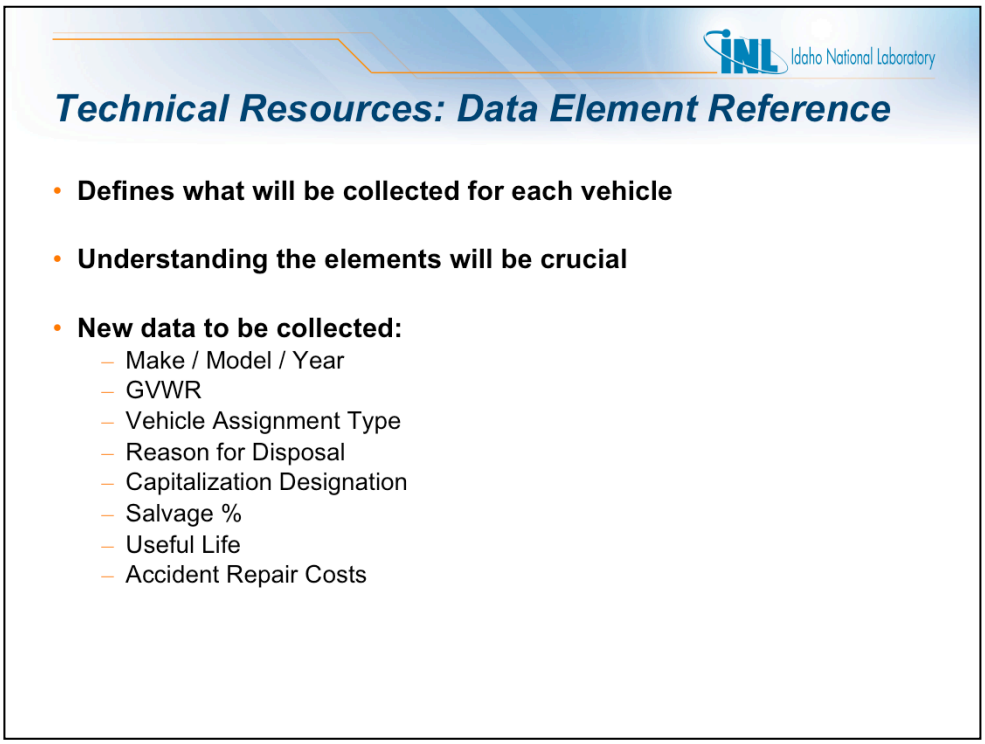
- Primarily of value for agencies who are already collecting the needed data and believe they will be in a position of reporting it at that level this fall

-All agencies should be targeting being ready to collect needed VLD for fleet operation through FY 2017

- Means mostly ready to COLLECT data by the end of this FY
- Example: making sure you're collecting costs in a manner that allows them to go into the right bins as they come in the VLD report (e.g., accident costs)

-All agencies should be targeting being ready to REPORT VLD at the end of FY 2017

In terms of planning, initial focus – based on that schedule – should be on making sure MIS has support for the needed data elements, with secondary focus on reporting that data in a VLD shape a year later.



The data element list identifies what information must be provided about each vehicle that was in your fleet during the fiscal year for which data is being reported.

Several iterations have been available and publicly discussed with agency leads several times over the past 9 months. Lots of valuable feedback on both proposed data elements and information about agency processes (particular the out-year projections) came from the agencies and have been factored into both the data elements list and the business rules.

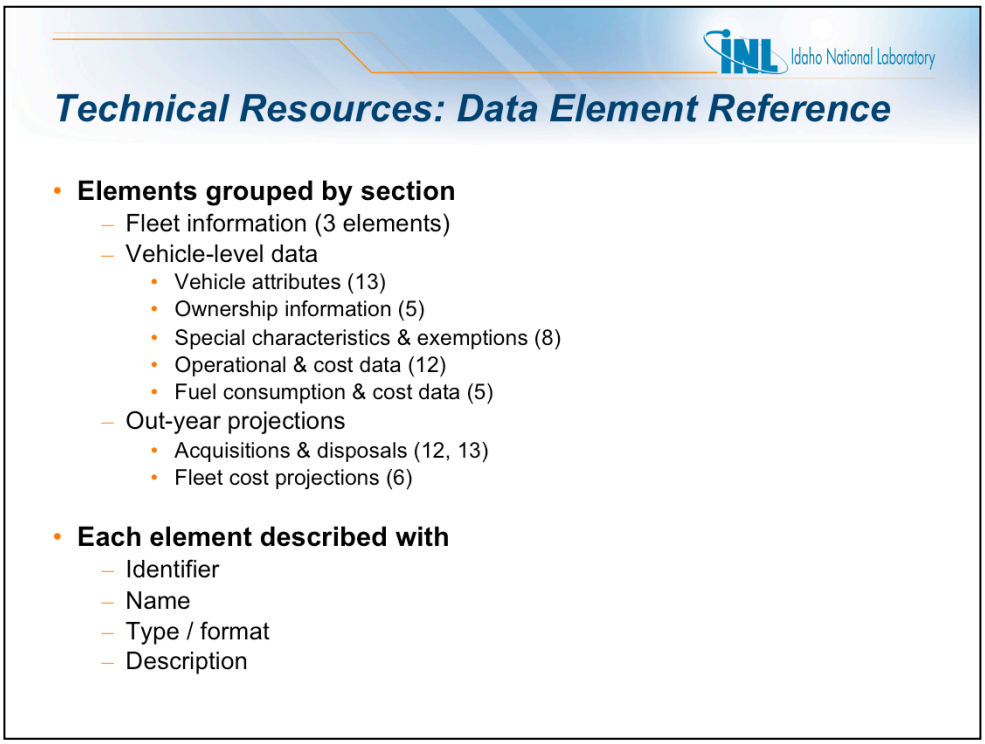
Understanding the elements: discuss costs as an example; mention existence of "Cost Decision Tree" reference

Very little additional data will be collected compared to the prior shape, when you look at it in detail against current data attributes

-Looks like a much bigger change because there is more detail to certain attributes in some cases

-By moving away from the three separate "sections" of data and shifting all of those to the vehicle level, it appears to expand the data set… but in most cases, we're just moving all of those different attributes to the vehicle level

- Example: Section 3 currently capture fuel based on fuel type, location, armored/LE/ER aspect of vehicles consuming the fuel, quantity, cost units; in the new shape, fuel is characterized only by location, type, units, quantity, cost because the other aspects are "inherited" from the individual vehicle consuming the fuel



Total of 38 elements per vehicle, plus 5 per fuel entry

Note that out-year projections are not technically VLD, but the incoming data stream can include them for organizations with MISs capable of providing them.

Technical Resources: Data Element Reference

Per Vehicle Information

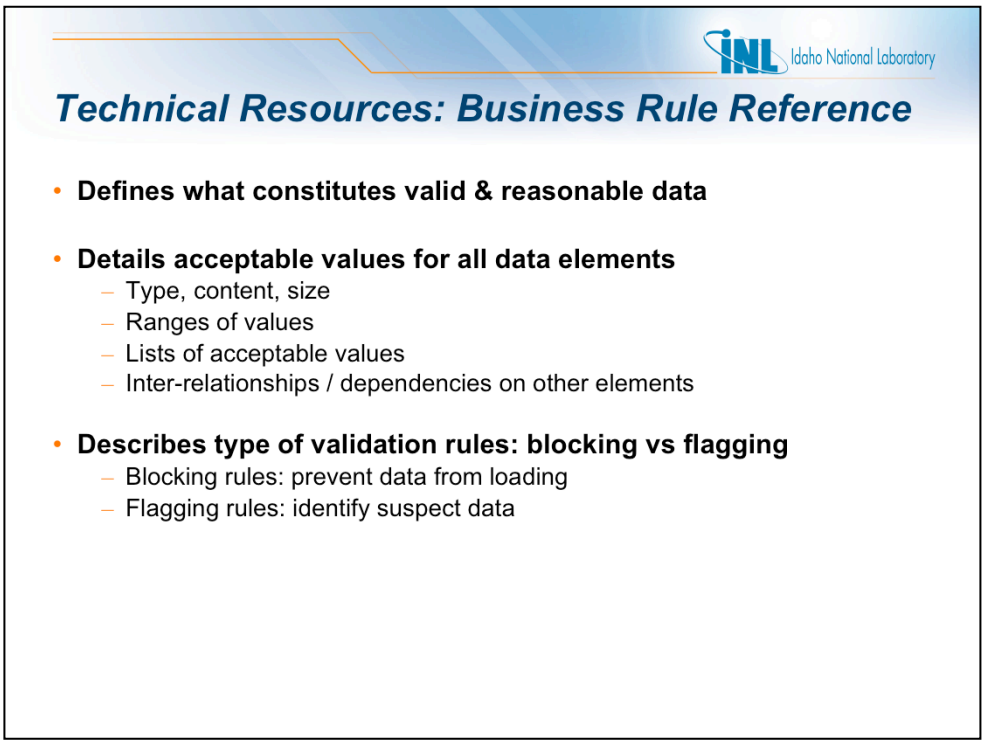
Vehicle Attributes			
Identifier	Element Name	Type/Format	Description
A-1	Unique Vehicle Identifier	Text	Any identifier--vehicle information number (VIN), asset identification, or other--that is unique within the agency (which also means that it cannot ever be reused within the agency), is permanent (so that it cannot ever be changed for a given vehicle), and avoids potential security concerns.
A-2	Make	Defined List	Vehicle manufacturer.
A-3	Model	Text	Vehicle manufacturer's model name.
A-4	Model Year	Numeric	Vehicle manufacturer's model year.
A-5	GVWR	Numeric	Gross vehicle weight rating (lbs).
A-6	Vehicle Type	Defined List	FAST vehicle type: Analogous to current set of FAST vehicle types (e.g., Low-speed Vehicle, Sedan/St Wgn Subcompact, Sedan/St Wgn Compact, Sedan/St Wgn Midsize, Sedan/St Wgn Large, LD Pickup 4x2, LD Pickup 4x4), but the set of supported vehicle types for VLD may differ from those currently supported in FAST.
A-7	Vehicle Fuel Type/Configuration	Defined List	Engine configuration and type(s) of fuel the vehicle is capable of consuming. The set of fuel type/engine configuration choices will be

Element Identifier

Name

Type

Description

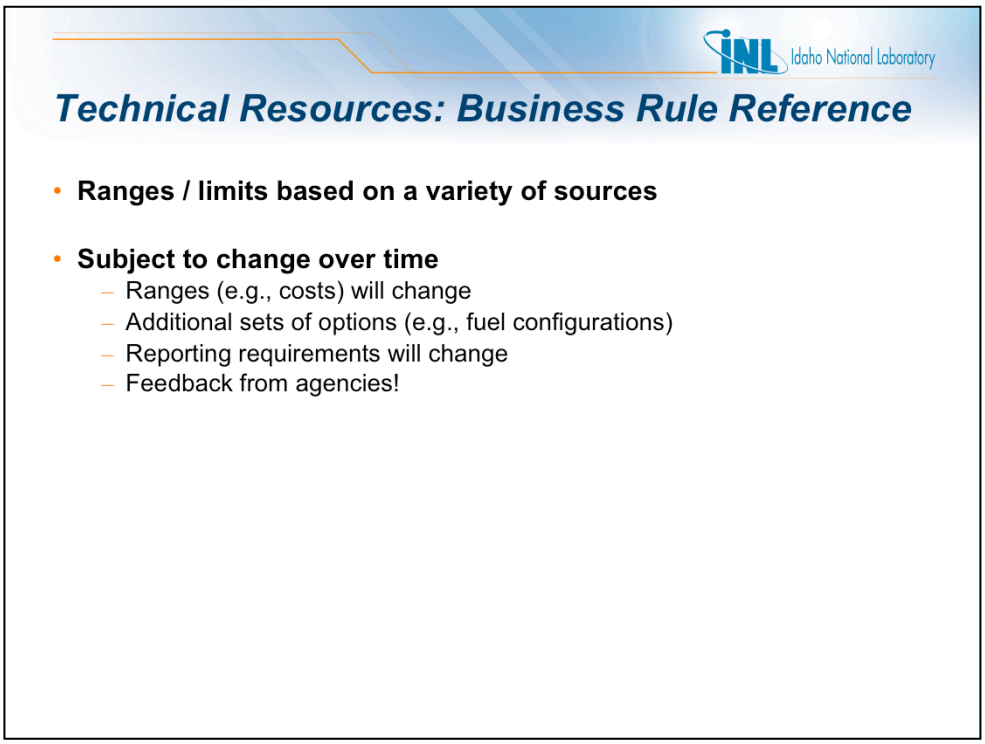


Data element list defines and describes *what* will be collected, whereas business rules define how those elements will be evaluated to make sure they are valid and can be used.

Business rules identify what's valid: invalid data will be rejected, questionable data will be flagged. "Flagging" rules are analogous to the older data validation framework within FAST, but much more comprehensive and (obviously) implemented for the most part at the vehicle level.

Total of 240 rules currently defined

They also identify expected ranges in some cases: data falling outside of those acceptable ranges will be accepted but will be flagged as possibly suspect. Users will be able to review and explore information about what within their data was flagged in that manner.



Initial sets of ranges / limits based on information from a variety of sources:

-Historical and recent FAST data

-Recent historical data from agency MISs

-External third-party sources

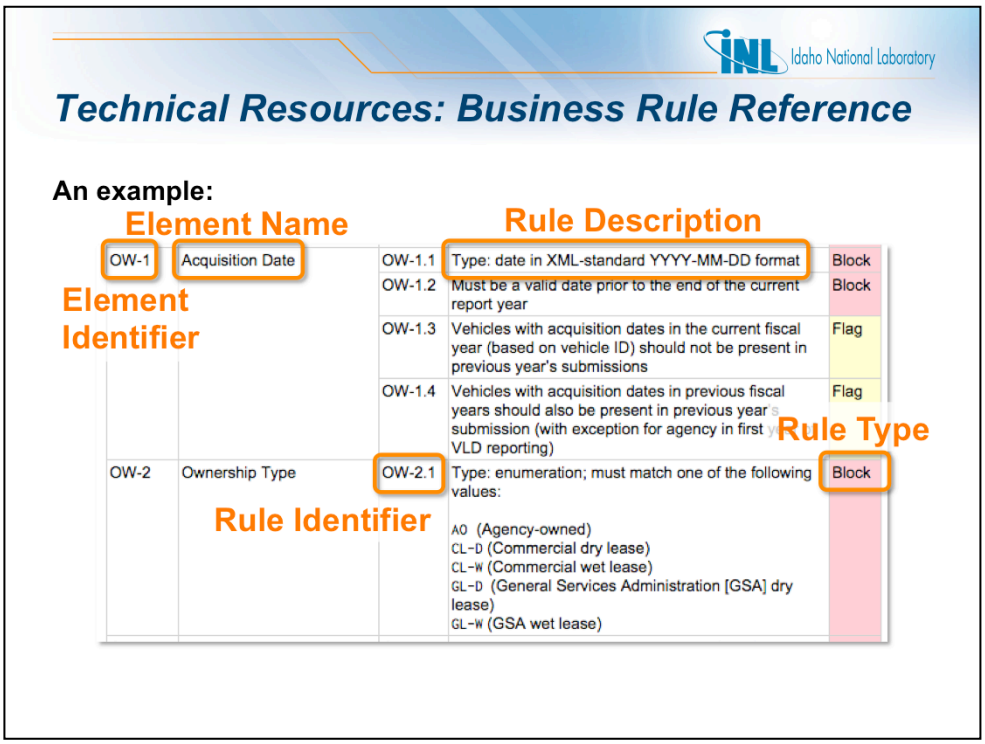
These rules will change over time:

-Based on feedback from agencies

-From analyzing what gets flagged as agencies begin providing vehicle-level data (intent is to make sure that there's a meaningful balance in what gets flagged, making sure it remains valuable)

-Changing requirements may bring changes here (and possibly to the set of data elements!)

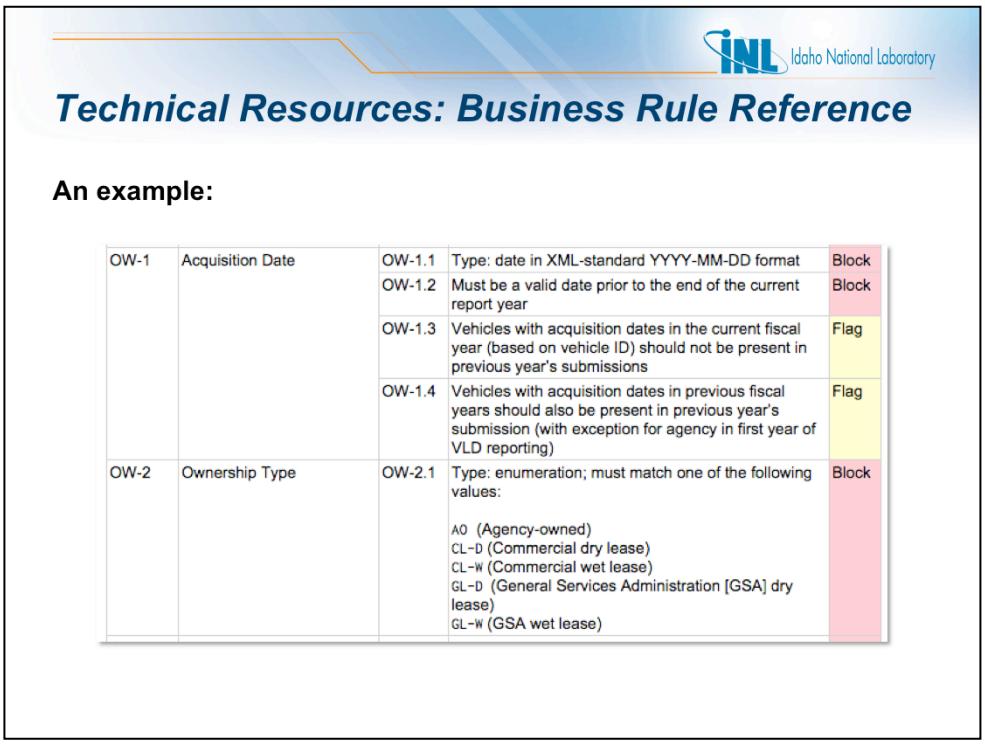
Important that you and your technical POC(s) for your fleet MIS review business rules with an eye to how your data fits within those rules.



Element identifier and element name tie rules back to data elements in the corresponding reference.

Rule identifiers tie rules back to data elements, and will be used where possible in diagnostics produced as part of data loading processes.

Each rule identified as either a “blocking rule” (prevents data from being loaded) or a “flagging rule” (data falls outside expectations for some aspect of reasonableness).



Two examples:

-Acquisition date

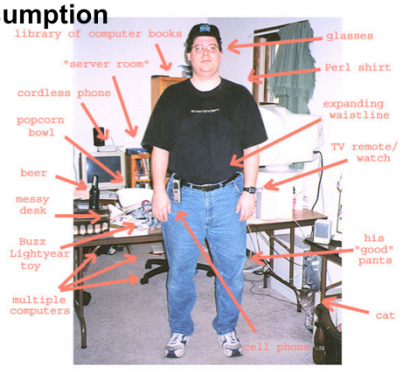
- First rule deals with the data type and syntax
- Second rule deals just with this data element within the context of this year's submission
- Remaining rules deal with this data element within the context of previous year's submissions

-Ownership type

- Single rule, dealing with the type (an enumeration, in this case) and the specific set of values to be accepted for this data element, along with the meaning of each designation

Technical Resources: XML Schema

- **Schema: structured syntax definition**
  - Specific data format your MIS must produce
  - Tools available to validate XML
- **XML: not intended for human consumption**
  - … or production



The schema is a technical product. Defines format of incoming data.

The schema is not a document that a "normal" or fleet person will be able to look at and make much sense of. This is a document that will be of use to the technical team supporting your MIS, so they know what the out-going data has to look like. They can also use this document as the basis for validating your MIS's outgoing data stream to make sure it will be accepted by FAST.

As soon as the schema is published, you'll want to make sure that your fleet MIS technical team know where to find it.

In addition, XML itself is not really intended for human consumption or production. Technically, it might be possible for someone to manually create an XML file for a small number of vehicles that conforms to the schema specification, but it is really intended for system production and system consumption.

Technical Resources: XML Schema

Basic structure of XML:

```
<?xml version="1.0" encoding="UTF-8"?>
<fd:fast-vld xmlns:fd="..." xmlns:xsi="..." ... year="2016">
    <processing ... >
        ...
        (processing directives)
        ...
    </processing>
    ...
</fd:fast-vld>
```

Technical Resources: XML Schema

Basic structure of XML:

```
<?xml version="1.0" encoding="UTF-8"?>
<fd:fast-vld xmlns:fd="..." xmlns:xsi="..." ... year="2016">
    <processing ... >
        ...
    </processing>
    <fleet abbrev="DOE-HQ" poc-name="..." poc-email="..." ... >
        ...
    </fleet>
    <fleet abbrev="DOE-INL" poc-name="..." poc-email="..." ... >
        ...
    </fleet>
    ...
</fd:fast-vld>
```

Technical Resources: XML Schema

Basic structure of XML:

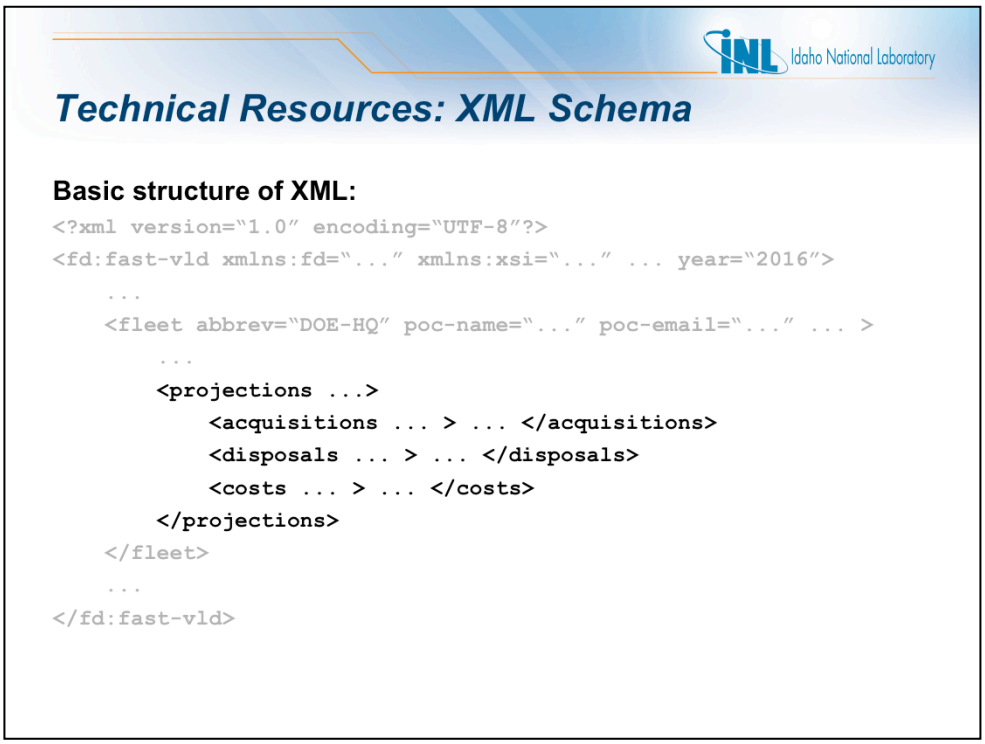
```
<?xml version="1.0" encoding="UTF-8"?>
<fd:fast-vld xmlns:fd="..." xmlns:xsi="..." ... year="2016">
    ...
    <fleet abbrev="DOE-HQ" poc-name="..." poc-email="..." ... >
        <vehicle vid="..." make="CHEVROLET" model="..." ...>
            ...
        </vehicle>
        <vehicle vid="..." make="FORD" model="..." ...>
            ...
        </vehicle>
        ...
    </fleet>
    ...
</fd:fast-vld>
```

Technical Resources: XML Schema

Basic structure of XML:

```
<?xml version="1.0" encoding="UTF-8"?>
<fd:fast-vld xmlns:fd="..." xmlns:xsi="..." ... year="2016">
    ...
    <fleet abbrev="DOE-HQ" poc-name="..." poc-email="..." ... >
        <vehicle vid="..." make="CHEVROLET" model="..." ...>
            <fuel location="DC" type="GAS" volume="..." ... />
            <fuel location="VA" type="GAS" volume="..." ... />
            <fuel location="VA" type="E85" volume="..." ... />
            ...
        </vehicle>
        ...
    </fleet>
    ...
</fd:fast-vld>
```

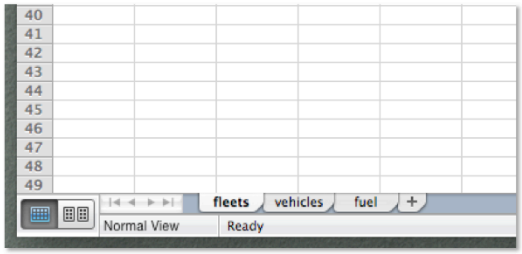
Important to note that vehicle and its costs and its mileage and its fuel are an atomic unit, with as many fuel entries as needed to capture different fuel types and locations.



We will provide, as an additional resource, an example (albeit artificial) of a valid, annotated XML file that conforms to the published schema; may be valuable to your system POCs as they look at what it will take to produce the needed XML.

Technical Resources: Excel Import Template

- **Limitations:**
  - **Not as scalable as XML**
  - **Will likely require manual effort**
  - **Subset of coverage of XML**
- **May make short-term sense in some scenarios**
  - **Data in multiple systems**
  - **Delay in MIS ability to generate XML**

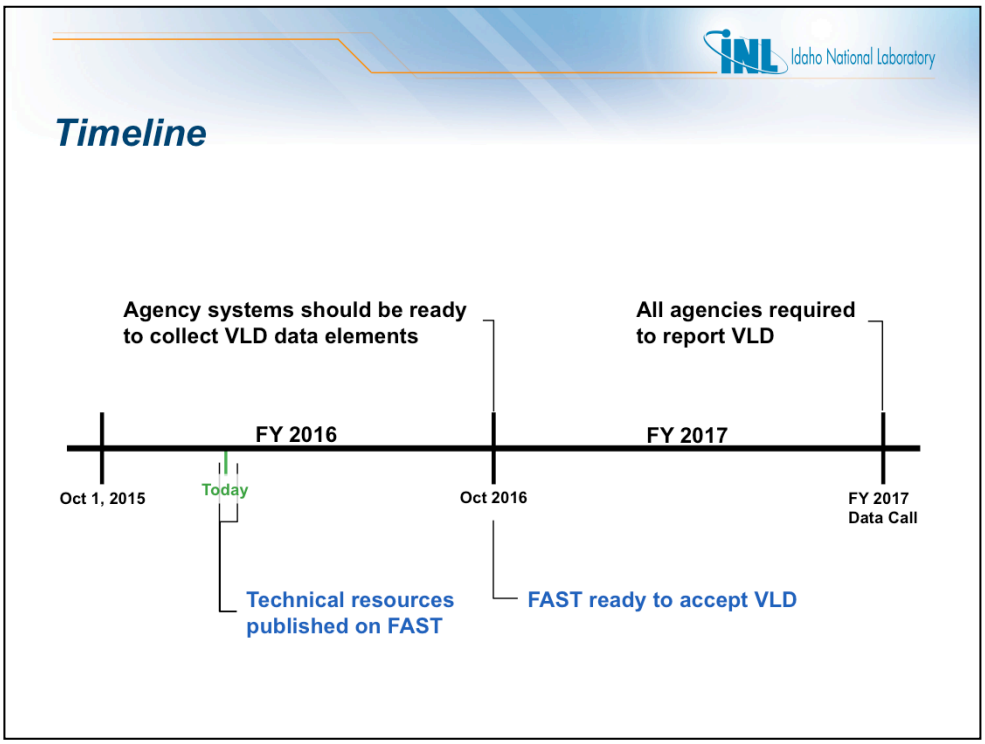


Limitations:

- Scalability: Excel has inherent limitations in # of rows, slower to process
- Excel will not include ability to bring in fleet projections (acquisitions, disposals, costs) or processing directives needed for automated handling of import files (absence of processing directives means Excel can't be used for fully-automated reporting)

Where does it make sense:

- Situations where data for a vehicle is not yet in a single system (e.g., costs in one system, vehicle attributes in another, fuel in another)
- Situations where changes to MIS to produce XML may not be ready by needed timeframe



Revisiting timeline:

-Use available references to start the gap analysis and migration effort (if you have not already done so)

-Figure out which changes need to be made earliest to systems and processes, and which are less pressing

-Evaluate existing data for alignment with the data elements and conformance with business rules

- And figure out how you'll address those areas

Discussion
Q & A

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